Global Survey Solutions Ltd.

Your Reference : KZ.II.06.0677

Tengizchevroil LLP
TCO Office
Tengiz Field, Zhylyoi District, Atyrau Region
060107, the Republic of Kazakhstan

For the attention of: To Whom It May Concern

CONTENTS LISTING

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Date of report	22-Sep-16
Vessel	Ramagas
Location	Tamanneftegas Terminal
Product	LPG Mix, Tech. Butane
Bill of Lading date	22-Sep-16

We have pleasure in enclosing herewith, our report for the above referenced inspection.
The inspection was carried out according to the following reports:

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Summary Of Quantities	One
Certificate Of Quantity Loaded (LPG Mix, Tech. Butane)	One
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Analysis Report (Grade 1: LPG Mix) - After Loading	One
Analysis Report (Grade 2: Tech. Butane) - After Loading	One
Total pages:	21 pages

Should you have any query, or require any additional information, please contact Mr. Alexey Akulov at our Moscow office (telephone number + 7 495 123 45 67).

Global Survey Solutions Ltd.

SUMMARY OF QUANTITIES

Report No. RU-0141-09-2016
Date of report 22-Sep-16
Vessel Ramagas
Location Tamanneftegas Terminal
Product LPG Mix, Tech. Butane

			Bill of Lading figures:		
BOL No.	Product name	BOL date	Metric Tons (vac)	Metric Tons (air)	GSV at 15°C, cu m
900/2-LPG	LPG Mix	22-Sep-16	4,258.222	4,249.063	7,999.666
900/1-B	Tech. Butane	22-Sep-16	342.092	341.426	592.880

Comparison of Ship's figures and Bill of Lading

Totals of the Bills Of Lading	LPG Mix	Tech. Butane		**Total**
Total Metric tons (vacuo)	4,258.222	342.092		4,600.314
Total Metric tons (air)	4,249.063	341.426		4,590.489
GSV at 15°C, cu m	7,999.666	592.880		8,592.546
METRIC TONS IN VACUO (GROSS WEIGHT)				**Total**
Bill of Lading	4,258.222	342.092		4,600.314
Vessel's loaded quantity	4,257.668	343.105		4,600.773
Difference	-0.554	1.013		0.459
% Difference	-0.013%	0.296%		0.010%
Bill of Lading	4,258.222	342.092		4,600.314
Vessel adjusted by VEF	4,276.055	344.587		4,620.642
Difference	17.833	2.495		20.328
% Difference	0.419%	0.729%		0.442%
METRIC TONS IN AIR (GROSS WEIGHT)				**Total**
Bill of Lading	4,249.063	341.426		4,590.489
Vessel's loaded quantity	4,248.513	342.442		4,590.955
Difference	-0.550	1.016		0.466
% Difference	-0.013%	0.298%		0.010%
Bill of Lading	4,249.063	341.426		4,590.489
Vessel adjusted by VEF	4,266.861	343.921		4,610.781
Difference	17.798	2.495		20.292
% Difference	0.419%	0.731%		0.442%
CUBIC METRES AT 15°C (GROSS STANDARD VOLUME)				**Total**
Bill of Lading	7,999.67	592.88		8,592.55
Vessel's loaded quantity	8,041.83	594.79		8,636.62
Difference	42.16	1.91		44.07
% Difference	0.527%	0.322%		0.513%
Bill of Lading	7,999.67	592.88		8,592.55
Vessel adjusted by VEF	8,076.56	597.36		8,673.91
Difference	76.89	4.48		81.37
% Difference	0.961%	0.755%		0.947%

For and on behalf of Global Survey Solutions Limited: Yuriy Voronin

Global Survey Solutions Ltd.

CERTIFICATE OF QUANTITY LOADED

Report No.	RU-0141-09-2016
Date of report	22-Sep-16
Vessel	Ramagas
Location	Tamanneftegas Terminal
Product	LPG Mix, Tech. Butane
Bill of Lading date	22-Sep-16

Shore tank figures:

GRAND TOTALS:	**LPG Mix**	**Tech. Butane**	**Grand Totals**
Total Metric tons (vacuo) :	4,258.222	342.092	4,600.314
Total Metric tons (air) :	4,249.063	341.426	4,590.489
GSV at 15°C, cu m :	7,999.253	592.852	8,592.105
Average Density at 15°C, kg/l :	0.5323	0.577	

For and on behalf of Global Survey Solutions Limited: Yuriy Voronin

Global Survey Solutions Ltd.

RECEIPT FOR DOCUMENTS

Report No.	RU-0141-09-2016
Date of report	22-Sep-16
Vessel	Ramagas
Location	Tamanneftegas Terminal
Product	LPG Mix, Tech. Butane
Bill of Lading date	22-Sep-16

This is to confirm that I, undersigned Ship's Officer did receive from the undersigned Surveyor the following documents:

Document Title	Qty
Receipt For Documents	One
Time Log	One
Ullage Report before Loading	One
Ullage Report after Loading	One
Vessel Experience Report	One
Tank Inspection Report	One
Total Pages:	6

Instructions regarding documents:	1 set for Vessel's own use

Should you have any query, or require any additional information, please contact Mr. Alexey Akulov at our Moscow office (telephone number + 7 495 123 45 67).

Chief Officer of "Ramagas": Alexey Petrov

For and on behalf of Global Survey Solutions Limited: Yuriy Voronin

Global Survey Solutions Ltd.

TIME LOG

Report No.	RU-0141-09-2016
Date of report	22-Sep-16
Vessel	Ramagas
Location	Tamanneftegas Terminal
Product	LPG Mix, Tech. Butane
Bill of Lading date	22-Sep-16

Time	Date	Operations
18:20	12-Sep-16	Vessel arrived at roads (End of Sea Passage)
18:20	12-Sep-16	Notice of Readiness tendered
18:54	12-Sep-16	Anchor dropped
08:30	18-Sep-16	Notice of Readiness accepted
08:50	18-Sep-16	Anchor aweigh
10:36	18-Sep-16	Pilot on board
11:36	18-Sep-16	Commenced mooring (first line ashore)
12:18	18-Sep-16	Vessel all fast alongside berth no. 4
12:36	18-Sep-16	Gangway secured
16:00	18-Sep-16	Cleared by Customs / Free Pratique granted
16:45	18-Sep-16	Inspector on board
17:24	18-Sep-16	OBQ in Vessel's tanks measured
17:24	18-Sep-16	Tank inspection completed
17:48	18-Sep-16	OBQ calculation completed
18:42	18-Sep-16	Hoses connected (1 x 8")
19:00	18-Sep-16	Commenced Loading 1st grade (LPG mix)
15:31	19-Sep-16	Commenced Loading 2nd grade (Tech. Butane)
18:25	19-Sep-16	Completed Loading 2nd grade (Tech. Butane)
04:18	22-Sep-16	Completed Loading 1st grade (LPG mix) - by Shore
05:45	22-Sep-16	Vessel's tanks measured
06:30	22-Sep-16	Loaded quantity calculation completed
07:06	22-Sep-16	Hose disconnected
09:00	22-Sep-16	Official cargo documents on board
10:30	22-Sep-16	Vessel sailed (ETS)

DELAYS				REASON
From		To		
18:20	12-Sep-16	10:36	18-Sep-16	Awaiting berthing instructions
10:36	18-Sep-16	12:18	18-Sep-16	Pilotage
15:00	18-Sep-16	16:00	18-Sep-16	Safety meeting
16:00	18-Sep-16	18:12	18-Sep-16	Awaiting weather improvement
07:45	20-Sep-16	19:30	21-Sep-16	Loading of 2nd grade suspended due to bad weather
04:18	22-Sep-16	06:35	22-Sep-16	Measurements and calculations

Remarks: (*) - As per information received from the Master of the vessel

Sea water temperature, °C
18

General weather condition
Calm

Product Name	Pumping time hours minutes	Bill of Lading Mt air	Pumping rate Mt air / hour
LPG Mix	21 hours 33 minutes	4,249.063	197.172
Tech. Butane	2 hours 54 minutes	341.426	117.733

Chief Officer of "Ramagas": Alexey Petrov

For and on behalf of Global Survey Solutions Limited: Yuriy Voronin

Global Survey Solutions Ltd.

VESSEL ULLAGE REPORT BEFORE LOADING

Report No.	RU-0141-09-2016
Date of report	22-Sep-16
Vessel	Ramagas
Location	Tamanneftegas Terminal
Product	LPG Mix, Tech. Butane
Bill of Lading date	22-Sep-16

VCF calculated by API Standard 2540, MPMS Ch 11.2 dated 2007

UNITS: Volume: **cu.m**. Linear: **m.** Temp: **°C** Pressure: **bar**

Tank No.	1P	1S	2P	2S	3P	3S		
Cargo	Iso-Butane	Iso-Butane	LPG Mix	LPG Mix	Butane	Butane		
100% capacity of tanks:	2,500.130	2,498.350	2,524.970	2,524.960	2,524.980	2,524.220		
Observed Liquid Innage, m								
Liquid Temperature, °C								
Vapour Temperature, °C	6.00	6.00	-22.00	-22.00	0	0		
Vapour Pressure, bar	1.75	1.75	0.65	0.65	0.40	0.40		
Inert gases, %								

Liquid Phase Density @ 15oC (in vacuo) calculated from GC composition Total: MT (vacuo)

Correction for *Trim / List, m*								
Correction for *Float Buoy., m*								
Correction for *Tape, m*								
Corrected Liquid Innage, m								
Liquid Volume, m^3								
Shrinking Factor								
Volume corrected, m^3								
Density at 15°C								
VCF by Table 54E								
Liquid Volume at 15°C, m^3								
Liquid Metric tons (vac)								

Vapour Phase Total: 66.085 MT (vacuo)

Mol.Mass	51.851	51.851	43.337	43.337	56.808	56.808		
Vapour Volume, m^3	2,500.130	2,498.350	2,524.970	2,524.960	2,524.980	2,524.220		
Corr.Vap.Vol. for *In.Gas.*	2,500.130	2,498.350	2,524.970	2,524.960	2,524.980	2,524.220		
Shrinking Factor	0.999480	0.999800	0.998450	0.998450	0.999260	0.999260		
Volume corrected, m^3	2,498.830	2,497.850	2,521.056	2,521.046	2,523.112	2,522.352		
Vapour Density, (kg/m^3)	6.1731	6.1731	3.4518	3.4518	3.5350	3.5350		
Vapour Metric tons (vac)	15.426	15.419	8.702	8.702	8.919	8.917		
Total Metric tons (vac)	15.426	15.419	8.702	8.702	8.919	8.917		
Correction Factor to air	0.99785	0.99785	0.99765	0.99765	0.99805	0.99805		
Total Metric tons (air)	15.393	15.386	8.682	8.682	8.902	8.900		
GSV at 15°C, cu m	28.807	28.794	17.590	17.590	15.544	15.540		

Before loading:

Total Metric tons (vac)	15.426	15.419	8.702	8.702	8.919	8.917		
Total Metric tons (air)	15.393	15.386	8.682	8.682	8.902	8.900		
GSV at 15°C, cu m	28.807	28.794	17.590	17.590	15.544	15.540		

Total quantity before loading:	**LPG Mix**	**Iso-Butane**	**Butane**	**Total**
Metric Tons (vacuo)	17.404	30.845	17.836	66.085
Metric Tons (air)	17.364	30.779	17.802	65.945
Cubic Metres at 15°C	35.180	57.601	31.084	123.865

Sea Condition : Moderate
Draft FWD : 3.90 m
AFT : 6.10 m
TRIM : 2.20 m
LIST : Nil

Remarks :

Density @ 15°C (in vacuo) calculated from GC composition
Vessel calculations based upon calibration tables for LPG/C "Clipper Scagen".

Chief Officer of ''Ramagas'': Alexey Petrov

For and on behalf of Global Survey Solutions Limited: Yuriy Voronin

Global Survey Solutions Ltd.

Report No.	RU-0141-09-2016
Date of report	22-Sep-16
Vessel	Ramagas
Location	Tamanneftegas Terminal
Product	LPG Mix, Tech. Butane
Bill of Lading date	22-Sep-16

VESSEL ULLAGE REPORT AFTER LOADING

VCF calculated by API Standard 2540, MPMS Ch 11.2 dated 2007

UNITS: Volume: **cu.m**. Linear: **m.** Temp: **°C** Pressure: **bar**

Tank No.	1P	1S	2P	2S	3P	3S		
Cargo	Tech. Butane	Tech. Butane	LPG Mix	LPG Mix	LPG Mix	LPG Mix		
100% capacity of tanks:	2,500.130	2,498.350	2,524.970	2,524.960	2,524.980	2,524.220		
Observed Liquid Innage, m	2.030	1.946	10.650	10.785	6.415	6.260		
Liquid Temperature, °C	16.90	16.80	1.40	-1.80	0.50	0.50		
Vapour Temperature, °C	10.00	13.00	-2.00	-4.30	-1.80	-1.80		
Vapour Pressure, bar	1.37	1.37	3.20	3.20	3.25	3.25		
Inert gases, %								
Liquid Phase	Density @ 15oC (in vacuo) calculated from GC composition					Total, Mt vac:	4,620.231	MT (vacuo)
Correction for *Trim / List, m*	-0.123	-0.123	-0.142	-0.143	-0.143	-0.134		
Correction for *Float Buoy., m*	1.958	1.873	10.564	10.698	6.338	6.183		
Correction for *Tape, m*								
Corrected Liquid Innage, m	3.865	3.696	21.072	21.340	12.610	12.309		
Liquid Volume, m^3	314.742	295.748	2,450.744	2,467.845	1,456.400	1,413.537		
Shrinking Factor	0.999886	0.999882	0.999316	0.999198	0.999280	0.999280		
Volume corrected, m^3	314.706	295.713	2,449.068	2,465.866	1,455.351	1,412.519		
Density at 15°C	0.5732	0.5732	0.5292	0.5292	0.5299	0.5299		
VCF by Table 54E	0.9961	0.9963	1.0335	1.0411	1.0355	1.0355		
Liquid Volume at 15°C, m^3	313.491	294.631	2,531.087	2,567.188	1,507.031	1,462.678		
Liquid Metric tons (vac)	179.693	168.882	1,339.451	1,358.556	798.576	775.073		
Vapour Phase							46.627	MT (vacuo)
Mol.Mass	57.445	57.445	48.624	48.624	48.740	48.740		
Vapour Volume, m^3	2,185.388	2,202.602	74.226	57.115	1,068.580	1,110.683		
Corr.Vap.Vol. for *In.Gas.*	2,185.388	2,202.602	74.226	57.115	1,068.580	1,110.683		
Shrinking Factor	0.999630	0.999740	0.999190	0.999101	0.999198	0.999198		
Volume corrected, m^3	2,184.579	2,202.029	74.166	57.064	1,067.723	1,109.792		
Vapour Density, (kg/m^3)	5.8152	5.7543	9.0870	9.1647	9.2100	9.2100		
Vapour Metric tons (vac)	12.704	12.671	0.674	0.523	9.834	10.221		
After loading:								
Total Metric tons (vac)	192.397	181.553	1,340.125	1,359.079	808.410	785.294		
Correction Factor to air	0.99805	0.99805	0.99785	0.99785	0.99785	0.99785		
Total Metric tons (air)	192.022	181.199	1,337.244	1,356.157	806.672	783.606		
GSV at 15°C, cu m	335.654	316.736	2,532.360	2,568.176	1,525.590	1,481.966		
Quantity Loaded:								
Total Metric tons (vac)	176.971	166.134	1,331.423	1,350.377	799.491	776.377		
Total Metric tons (air)	176.629	165.813	1,328.562	1,347.475	797.770	774.706		
GSV at 15°C, cu m	306.847	287.942	2,514.770	2,550.586	1,510.046	1,466.426		

Total Quantity Loaded:	**LPG Mix**	**Tech. Butane**	**Total**
Metric Tons (vacuo)	4,257.668	343.105	4,600.773
Metric Tons (air)	4,248.513	342.442	4,590.955
Cubic Metres at 15°C	8,041.828	594.789	8,636.617

Sea Condition : Moderate
Draft FWD : 8.00 m
AFT : 8.50 m
TRIM : 0.50 m
LIST : Nil

Remarks :

Density @ 15°C (in vacuo) calculated from GC composition
Vessel calculations based upon calibration tables for LPG/C "Clipper Scagen". Densities and Molar masses in ship's tanks were calculated pro rata OBQ and shore quantities

Chief Officer of ''Ramagas'': Alexey Petrov

For and on behalf of Global Survey Solutions Limited: Yuriy Voronin

Global Survey Solutions Ltd.

VESSEL EXPERIENCE REPORT

Report No. RU-0141-09-2016
Date of report 22-Sep-16
Vessel Ramagas
Location Tamanneftegas Terminal
Product LPG Mix, Tech. Butane
Bill of Lading date 22-Sep-16

Voyage	Bill of Lading date	Cargo	Loadport	Vessel's figure Mt	Bill of Lading Mt	Vessel Load Ratio	Quali-fying
Last	20-Jul-16	C3/C3-C4/iso-C4	Taman	5,541.575	5,569.918	0.99497	Yes
2nd last	19-May-16	Tech.C4/C3-C4/C4	Taman	8,259.701	8,293.899	0.99590	Yes
3rd last	30-Apr-16	LPG Mix	Taman	6,189.978	6,220.750	0.99502	Yes
4th last	27-Feb-16	Tech. Butane	Taman	8,588.695	8,622.232	0.99617	Yes
5th last	07-Feb-16	Iso-Butane	Taman	2,667.894	2,676.842	0.99664	Yes

Voyages excluded :

When Bill Of Lading is based on shipboard measurements.

Voyages prior to any structural cargo tank modifications.

Lighterings.

First voyage after dry dock.

Total	31,247.843	31,383.641
Total Qualifying	31,247.843	31,383.641
First average		0.99567
	+ 0.3 %	0.99866
	- 0.3 %	0.99269
Second Average		0.99567
	+ 0.3 %	0.99866
	- 0.3 %	0.99268

Ship's figures this voyage (Excluding OBQ)	4,600.773
Bill of Lading this voyage	4,600.314
Vessel loaded ratio this voyage	1.00010

Vessel Experience Factor based on 2nd average

0.9957

The above mentioned quantities are for the last 0 voyages as obtained from ship's record and cannot be guaranteed as accurate by the surveyor. No liability can be assumed for errors resulting from improper information supplied by the vessel.

Remarks:

For receipt,
Chief Officer of "Ramagas": Alexey Petrov

For and on behalf of
Global Survey Solutions Limited
Surveyor's name Yuriy Voronin

Global Survey Solutions Ltd.

VESSEL TANK INSPECTION REPORT

Report No.	RU-0141-09-2016
Date of report	22-Sep-16
Vessel	Ramagas
Location	Tamanneftegas Terminal
Product	LPG Mix, Tech. Butane
Bill of Lading date	22-Sep-16

	Time:	Date:
Tank inspection was carried out:	17:24	18-Sep-16

Inspection of "Ramagas" at on the September 18, 2016.

GENERAL INFORMATION

Name of Vessel:	Ramagas
Loading Place:	Tamanneftegas Terminal
Installation:	LPG Terminal, berth No. 4
Date:	18-Sep-16
Cargoes to be loaded:	LPG Mix Tech.

INFORMATION OBTAINED ON BOARD

Previous cargoes:	Iso-Butane	in cargo tanks:	1P, 1S
	Butane		3P, 3S
	LPG Mix		2P, 2S

Quantity remaining on board:	65.945 Metric Tons (air)
Method of cleaning, if any:	none

TEST RESULTS ON VAPOURS AFTER PURGING WITH NITROGEN

Oxygen Content, % by volume: Less than 0.3

CONCLUSION

As the oxygen content was below the limit of 0.3% by volume and previous cargo being compatible with cargoes to be loaded, all ships cargo tanks were found to be in a satisfactory condition to receive designated cargoes.

For receipt,
Chief Officer of "Ramagas": Alexey Petrov

For and on behalf of
Global Survey Solutions Limited
Surveyor's name Yuriy Voronin

Global Survey Solutions Ltd.

SAMPLE RECEIPT

Report No. RU-0141-09-2016
Date of report 22-Sep-16
Vessel Ramagas
Location Tamanneftegas Terminal
Product LPG Mix, Tech. Butane
Bill of Lading date 22-Sep-16

Product	Sample source	Size	Sample description	Seal No.	Sample Distribution
LPG Mix	In-line autosampler	1 Ltr.	Taken during loading	12345	For Receiver
Tech. Butane	Single ship's tank composite	1 Ltr.	Multiple ship's tank composite	12346	For Receiver

Date: 22-Sep-16 Receipt acknowledged

Chief Officer of "Ramagas": Alexey Petrov

Surveyor's name Yuriy Voronin

Global Survey Solutions Ltd.

SAMPLE REPORT

Report No. RU-0141-09-2016
Date of report 22-Sep-16
Vessel Ramagas
Location Tamanneftegas Terminal
Product LPG Mix, Tech. Butane
Bill of Lading date 22-Sep-16

Product	Sample source	Size	Sample description	Seal No.	Sample Distribution
LPG Mix	In-line autosampler	1 Ltr.	Taken during loading	12351	For testing
Tech. Butane	In-line autosampler	1 Ltr.	Taken during loading	12352	For testing

Date: 22-Sep-16

Surveyor's name Yuriy Voronov

Global Survey Solutions Ltd.

LETTER OF PROTEST ON APPARENT DISCREPANCY

Report No.	RU-0141-09-2016
Date of report	22-Sep-16
Vessel	Ramagas
Location	Tamanneftegas Terminal
Product	LPG Mix
Bill of Lading date	22-Sep-16

To: To Whom It May Concern

At the Port of: Taman

Dear Sir,

On behalf of our principal(s), we hereby notify you that on the day of 22-Sep-16 the following occurrence was noted:

APPARENT DISCREPANCY:

Grade 1	LPG Mix
	Metric Tons in vacuo (Gross Weight)
Bill of Lading	4,258.222
Vessel's loaded quantity	4,257.668
Difference	-0.554
% Difference	-0.013%
Bill of Lading	4,258.222
Vessel adjusted by VEF	4,276.055
Difference	17.833
% Difference	0.419%
	Metric Tons in air (Gross Weight)
Bill of Lading	4,249.063
Vessel's loaded quantity	4,248.513
Difference	-0.550
% Difference	-0.013%
Bill of Lading	4,249.063
Vessel adjusted by VEF	4,266.861
Difference	17.798
% Difference	0.419%

Accordingly, we are holding you responsible for the loss and damage thereby sustained, as well as any consequential arising therefrom.

Please direct any written correspondence on this matter to:

Mr. Alexey Akulov
Global Survey Solutions Limited

Tel: + 7 495 123 45 67
Fax: + 7 495 123 45 68
Email: ops@surveycalc.com

Very truly yours:

Date: September 22, 2016
Signed by: Yuriy Voronin
For: Surveyor

Receipt acknowledged:

Date: September 22, 2016
Signed by: Vitaliy Tomilovskiy
For: Ship

Global Survey Solutions Ltd.

LETTER OF PROTEST ON APPARENT DISCREPANCY

Report No.	RU-0141-09-2016
Date of report	22-Sep-16
Vessel	Ramagas
Location	Tamanneftegas Terminal
Product	Tech. Butane
Bill of Lading date	22-Sep-16

To: To Whom It May Concern

At the Port of: Taman

Dear Sir,

On behalf of our principal(s), we hereby notify you that on the day of 22-Sep-16 the following occurrence was noted:

APPARENT DISCREPANCY:

Grade 2	Tech. Butane
	Metric Tons in vacuo (Gross Weight)
Bill of Lading	342.092
Vessel's loaded quantity	343.105
Difference	1.013
% Difference	0.296%
Bill of Lading	342.092
Vessel adjusted by VEF	344.587
Difference	2.495
% Difference	0.729%
	Metric Tons in air (Gross Weight)
Bill of Lading	341.426
Vessel's loaded quantity	342.442
Difference	1.016
% Difference	0.298%
Bill of Lading	341.426
Vessel adjusted by VEF	343.921
Difference	2.495
% Difference	0.731%

Accordingly, we are holding you responsible for the loss and damage thereby sustained, as well as any consequential arising therefrom.

Please direct any written correspondence on this matter to:

Mr. Alexey Akulov
Global Survey Solutions Limited

Tel: + 7 495 123 45 67
Fax: + 7 495 123 45 68
Email: ops@surveycalc.com

Very truly yours:

Date: September 22, 2016
Signed by: Yuriy Voronin
For: Surveyor

Receipt acknowledged:

Date: September 22, 2016
Signed by: Vitaliy Tomilovskiy
For: Ship

Global Survey Solutions Ltd.

STATEMENT OF FACTS

Report No.	RU-0141-09-2016
Date of report	22-Sep-16
Vessel	Ramagas
Location	Tamanneftegas Terminal
Product	LPG Mix, Tech. Butane
Bill of Lading date	22-Sep-16

For the attention of: To Whom It May Concern
Copy to:

At the Port of: Taman

Dear Sirs,

On behalf of our principal(s), we hereby notify you that on the day of 22-Sep-16 the following occurrence was noted:

Due to the moderate swelling the measurements taken on board LPG / C "Ramagas" may affect on accuracy of determination of quantity of LPG in ship's tanks.

Very truly yours:

Date: September 22, 2016

Signed by: Yuriy Voronin

For: Surveyor

Global Survey Solutions Ltd.

Report No. RU-0141-09-2016
Date of report 22-Sep-16
Vessel Ramagas
Location Tamanneftegas Terminal
Bill of Lading date 22-Sep-16

SHORE TANK REPORT

VCF calculated by API Standard 2540, MPMS Ch 11.2 dated 2007

		Tank No. **17**		Tank No. **18**		Tank No. **21**	
LIQUID PHASE		Before	After	Before	After	Before	After
Product		LPG Mix	LPG Mix	LPG Mix	LPG Mix	LPG Mix	LPG Mix
Date	dd-mm-yy	18-Sep-16	19-Sep-16	18-Sep-16	19-Sep-16	18-Sep-16	19-Sep-16
Time	0000	18:59	05:40	18:59	05:40	18:59	05:40
Total Tank Volume	cu m	602.523	602.523	604.379	604.379	614.256	614.256
Shrinkage Factor for Total Volume		0.99989	0.99964	0.99996	0.99971	1.00002	0.99977
Total Volume Corrected	cu m	602.457	602.306	604.355	604.204	614.268	614.115
Liquid level corrected	m	3.588	0.334	3.746	0.233	3.670	0.427
Liquid Volume	cu m	463.502	14.447	487.297	8.131	484.435	22.304
Liquid Temperature	°C	22.6	14.6	21.1	13.6	22.9	15.7
Shrinkage Factor for Liquid Volume		1.00006	0.9999	1.00003	0.99988	1.00007	0.99992
Liquid Volume Corrected	cu m	463.530	14.446	487.312	8.130	484.469	22.302
Density at 15°C	kg/l	0.5389	0.5389	0.5344	0.5344	0.5319	0.5319
Volume Correction Factor	Table 54E	0.98135	1.00096	0.98471	1.00345	0.97983	0.99824
Liquid Volume at 15°C	cu m	454.885	14.460	479.861	8.158	474.697	22.263
Liquid Mass	Mt	245.138	7.792	256.438	4.360	252.491	11.842
VAPOUR PHASE							
Vapour Vol. Corrected	cu m	138.927	587.860	117.043	596.074	129.799	591.813
Vapour Temperature	°C	11.5	6.1	16.9	11.1	18.1	12.1
Vapour Pressure	kg/cm2	7.905	5.548	8.228	5.541	7.874	5.55
Molecular Mass	g/mole	50.195	50.195	49.491	49.491	49.074	49.074
Vapour Density	kg/m^3	18.5898	13.9532	18.6384	13.5009	17.702	13.3588
Vapour Mass	Mt	2.583	8.203	2.181	8.048	2.298	7.906
Total Mass	Mt	247.721	15.995	258.619	12.408	254.789	19.748
Difference, Mass	Mt	231.726		246.211		235.041	
Total Weight in Air	Mt	247.188	15.961	258.063	12.381	254.241	19.706
Difference, Weight in Air	Mt	231.227		245.682		234.535	
GSV at 15°C	cu m	459.679	29.681	483.943	23.219	479.017	37.127
Difference, GSV at 15°C	cu m	429.998		460.724		441.890	

		Tank No. **22**		Tank No. **23**		Tank No. **24**	
LIQUID PHASE		Before	After	Before	After	Before	After
Product		LPG Mix	LPG Mix	LPG Mix	LPG Mix	LPG Mix	LPG Mix
Date	dd-mm-yy	18-Sep-16	19-Sep-16	18-Sep-16	19-Sep-16	18-Sep-16	19-Sep-16
Time	0000	18:59	05:40	18:59	09:55	18:59	05:40
Total Tank Volume	cu m	602.399	602.399	609.796	609.796	609.776	609.776
Shrinkage Factor for Total Volume		1.00003	0.99978	1.00003	0.99984	1.00003	0.99984
Total Volume Corrected	cu m	602.417	602.266	609.814	609.698	609.794	609.678
Liquid level corrected	m	3.711	0.403	3.607	0.457	3.634	0.454
Liquid Volume	cu m	481.926	20.406	472.722	24.852	476.436	24.508
Liquid Temperature	°C	21.7	14.9	21.8	15.8	21.8	15.6
Shrinkage Factor for Liquid Volume		1.00004	0.9999	1.00004	0.99992	1.00004	0.99992
Liquid Volume Corrected	cu m	481.945	20.404	472.741	24.850	476.455	24.506
Density at 15°C	kg/l	0.5341	0.5341	0.5311	0.5311	0.5327	0.5327
Volume Correction Factor	Table 54E	0.98315	1.00025	0.98261	0.99798	0.98276	0.99850
Liquid Volume at 15°C	cu m	473.824	20.409	464.520	24.800	468.241	24.469
Liquid Mass	Mt	253.069	10.900	246.707	13.171	249.432	13.035
VAPOUR PHASE							
Vapour Vol. Corrected	cu m	120.472	581.862	137.073	584.848	133.339	585.172
Vapour Temperature	°C	19.8	13.4	19.6	15.6	19.6	15.7
Vapour Pressure	kg/cm2	7.86	5.555	7.741	5.879	7.837	5.822
Molecular Mass	g/mole	49.443	49.443	48.973	48.973	49.188	49.188
Vapour Density	kg/m^3	17.7032	13.4085	17.3115	13.8265	17.5774	13.7677
Vapour Mass	Mt	2.133	7.802	2.373	8.086	2.344	8.056
Total Mass	Mt	255.202	18.702	249.080	21.257	251.776	21.091
Difference		236.500		227.823		230.685	
Total Weight in Air	Mt	254.653	18.662	248.544	21.211	251.235	21.046
Difference, Weight in Air	Mt	235.991		227.333		230.189	
GSV at 15°C	cu m	477.817	35.016	468.989	40.024	472.641	39.593
Difference, GSV at 15°C	cu m	442.801		428.965		433.048	

SUB TOTALS:	**Product :**	**LPG Mix**	**Tech. Butane**	**Sub Totals**
Total Metric tons (vacuo) :		1,407.986		1,407.986
Total Metric tons (air) :		1,404.957		1,404.957
GSV at 15°C, cu m :		2,637.426		2,637.426

Terminal Representative: Ivan Anikin

Surveyor's name Yuriy Voronin

Global Survey Solutions Ltd.

Report No. RU-0141-09-2016
Date of report 22-Sep-16
Vessel Ramagas
Location Tamanneftegas Terminal
Bill of Lading date 22-Sep-16

SHORE TANK REPORT

VCF calculated by API Standard 2540, MPMS Ch 11.2 dated 2007

		Tank No. **25**		Tank No. **27**		Tank No. **17**	
LIQUID PHASE		Before	After	Before	After	Before	After
Product		LPG Mix	LPG Mix	LPG Mix	LPG Mix	LPG Mix	LPG Mix
Date	dd-mm-yy	19-Sep-16	19-Sep-16	19-Sep-16	19-Sep-16	19-Sep-16	20-Sep-16
Time	0000	09:55	14:54	09:55	11:51	19:18	03:53
Total Tank Volume	cu m	614.137	614.137	615.095	615.095	602.523	602.523
Shrinkage Factor for Total Volume		0.9998	0.99981	0.99999	0.99992	0.9999	0.99974
Total Volume Corrected	cu m	614.014	614.020	615.089	615.046	602.463	602.366
Liquid level corrected	m	3.641	0.422	2.708	0.407	3.759	0.373
Liquid Volume	cu m	481.546	22.420	337.840	21.535	486.958	17.263
Liquid Temperature	°C	14.6	14.8	19.7	17.9	17.3	13.0
Shrinkage Factor for Liquid Volume		0.99987	0.9999	0.99999	0.99996	0.99993	0.99987
Liquid Volume Corrected	cu m	481.483	22.418	337.837	21.534	486.924	17.261
Density at 15°C	kg/l	0.5339	0.5339	0.5311	0.5311	0.5309	0.5309
Volume Correction Factor	Table 54E	1.00099	1.00050	0.98804	0.99266	0.99418	1.00501
Liquid Volume at 15°C	cu m	481.960	22.429	333.796	21.376	484.090	17.347
Liquid Mass	Mt	257.318	11.975	177.279	11.353	257.003	9.210
VAPOUR PHASE							
Vapour Vol. Corrected	cu m	132.531	591.602	277.252	593.512	115.539	585.105
Vapour Temperature	°C	16.4	20.7	17.4	19.5	13.5	7.1
Vapour Pressure	kg/cm2	7.3	6.949	7.055	6.475	9.49	5.061
Molecular Mass	g/mole	49.413	49.413	48.882	48.882	48.858	48.858
Vapour Density	kg/m^3	16.7734	15.8322	16.0504	14.7921	21.1561	12.5308
Vapour Mass	Mt	2.223	9.366	4.450	8.779	2.444	7.332
Total Mass	Mt	259.541	21.341	181.729	20.132	259.447	16.542
Difference, Mass	Mt	238.200		161.597		242.905	
Total Weight in Air	Mt	258.983	21.295	181.338	20.089	258.889	16.506
Difference, Weight in Air	Mt	237.688		161.249		242.383	
GSV at 15°C	cu m	486.123	39.972	342.175	37.906	488.693	31.158
Difference, GSV at 15°C	cu m	446.151		304.269		457.535	

		Tank No. **18**		Tank No. **21**		Tank No. **22**	
LIQUID PHASE		Before	After	Before	After	Before	After
Product		LPG Mix	LPG Mix	LPG Mix	LPG Mix	LPG Mix	LPG Mix
Date	dd-mm-yy	19-Sep-16	20-Sep-16	19-Sep-16	20-Sep-16	19-Sep-16	20-Sep-16
Time	0000	19:18	03:53	19:18	03:53	19:18	07:40
Total Tank Volume	cu m	604.379	604.379	614.256	614.256	602.399	602.399
Shrinkage Factor for Total Volume		0.99985	0.99969	0.99992	0.9998	1	0.9999
Total Volume Corrected	cu m	604.288	604.192	614.207	614.133	602.399	602.339
Liquid level corrected	m	3.787	0.402	3.737	0.437	3.058	1.474
Liquid Volume	cu m	492.781	19.701	493.714	23.144	387.035	144.200
Liquid Temperature	°C	16.0	11.7	17.8	14.7	20.1	17.4
Shrinkage Factor for Liquid Volume		0.9999	0.99984	0.99995	0.9999	1	0.99995
Liquid Volume Corrected	cu m	492.732	19.698	493.689	23.142	387.035	144.193
Density at 15°C	kg/l	0.5320	0.5320	0.5332	0.5332	0.5359	0.5359
Volume Correction Factor	Table 54E	0.99749	1.00819	0.99299	1.00075	0.98735	0.99409
Liquid Volume at 15°C	cu m	491.495	19.859	490.228	23.159	382.139	143.341
Liquid Mass	Mt	261.475	10.565	261.390	12.348	204.788	76.816
VAPOUR PHASE							
Vapour Vol. Corrected	cu m	111.556	584.494	120.518	590.991	215.364	458.146
Vapour Temperature	°C	18.8	12.0	18.3	13.3	20.5	17.0
Vapour Pressure	kg/cm2	9.426	4.979	9.578	5.162	9.655	6.74
Molecular Mass	g/mole	49.045	49.045	49.261	49.261	49.679	49.679
Vapour Density	kg/m^3	20.7242	12.1971	21.1541	12.5655	21.3264	15.6983
Vapour Mass	Mt	2.312	7.129	2.549	7.426	4.593	7.192
Total Mass	Mt	263.787	17.694	263.939	19.774	209.381	84.008
Difference		246.093		244.165		125.373	
Total Weight in Air	Mt	263.220	17.656	263.372	19.731	208.931	83.827
Difference, Weight in Air	Mt	245.564		243.641		125.104	
GSV at 15°C	cu m	495.840	33.259	495.009	37.086	390.709	156.761
Difference, GSV at 15°C	cu m	462.581		457.923		233.948	

SUB TOTALS:	**Product :**	**LPG Mix**	**Tech. Butane**	**Sub Totals**
Total Metric tons (vacuo) :		1,258.333		1,258.333
Total Metric tons (air) :		1,255.629		1,255.629
GSV at 15°C, cu m :		2,362.407		2,362.407

Terminal Representative: Ivan Anikin

Surveyor's name Yuriy Voronin

Global Survey Solutions Ltd.

Report No. RU-0141-09-2016
Date of report 22-Sep-16
Vessel Ramagas
Location Tamanneftegas Terminal
Bill of Lading date 22-Sep-16

SHORE TANK REPORT

VCF calculated by API Standard 2540, MPMS Ch 11.2 dated 2007

		Tank No. **23**		Tank No. **24**		Tank No. **27**	
LIQUID PHASE		Before	After	Before	After	Before	After
Product		LPG Mix	LPG Mix	LPG Mix	LPG Mix	LPG Mix	LPG Mix
Date	dd-mm-yy	19-Sep-16	20-Sep-16	19-Sep-16	20-Sep-16	19-Sep-16	20-Sep-16
Time	0000	19:18	07:40	19:18	07:40	19:18	07:40
Total Tank Volume	cu m	609.796	609.796	609.776	609.776	615.095	615.095
Shrinkage Factor for Total Volume		0.99983	0.99977	0.99985	0.99977	1.00003	0.99997
Total Volume Corrected	cu m	609.692	609.656	609.685	609.636	615.113	615.077
Liquid level corrected	m	3.731	1.767	3.785	1.439	2.767	2.758
Liquid Volume	cu m	489.747	189.438	497.137	140.568	347.133	345.717
Liquid Temperature	°C	15.4	13.9	16.0	13.8	20.8	19.3
Shrinkage Factor for Liquid Volume		0.99989	0.99988	0.9999	0.99988	1.00002	0.99998
Liquid Volume Corrected	cu m	489.693	189.415	497.087	140.551	347.140	345.710
Density at 15°C	kg/l	0.5262	0.5262	0.5327	0.5327	0.5298	0.5298
Volume Correction Factor	Table 54E	0.99897	1.00284	0.99750	1.00298	0.98509	0.98899
Liquid Volume at 15°C	cu m	489.189	189.953	495.844	140.970	341.964	341.904
Liquid Mass	Mt	257.411	99.953	264.136	75.095	181.173	181.141
VAPOUR PHASE							
Vapour Vol. Corrected	cu m	119.999	420.241	112.598	469.085	267.973	269.367
Vapour Temperature	°C	21.4	16.5	21.3	16.7	20.1	17.7
Vapour Pressure	kg/cm2	9.988	5.396	10.12	5.416	7.764	7.315
Molecular Mass	g/mole	48.091	48.091	49.188	49.188	48.742	48.742
Vapour Density	kg/m^3	21.2237	12.5908	21.9744	12.9079	17.2464	16.5019
Vapour Mass	Mt	2.547	5.291	2.474	6.055	4.622	4.445
Total Mass	Mt	259.958	105.244	266.610	81.150	185.795	185.586
Difference, Mass	Mt	154.714		185.460		0.209	
Total Weight in Air	Mt	259.399	105.018	266.037	80.976	185.396	185.187
Difference, Weight in Air	Mt	154.381		185.061		0.209	
GSV at 15°C	cu m	494.029	200.008	500.488	152.337	350.689	350.294
Difference, GSV at 15°C	cu m	294.021		348.151		0.395	

		Tank No. **17**		Tank No. **18**		Tank No. **21**	
LIQUID PHASE		Before	After	Before	After	Before	After
Product		LPG Mix	LPG Mix	LPG Mix	LPG Mix	LPG Mix	LPG Mix
Date	dd-mm-yy	21-Sep-16	22-Sep-16	21-Sep-16	22-Sep-16	21-Sep-16	22-Sep-16
Time	0000	19:26	01:12	19:26	01:12	19:26	02:28
Total Tank Volume	cu m	602.523	602.523	604.379	604.379	614.256	614.256
Shrinkage Factor for Total Volume		0.99991	0.9998	0.99985	0.99975	0.99992	0.99984
Total Volume Corrected	cu m	602.469	602.402	604.288	604.228	614.207	614.158
Liquid level corrected	m	3.659	0.378	3.716	0.406	3.658	2.195
Liquid Volume	cu m	473.370	17.635	483.241	20.014	482.754	257.017
Liquid Temperature	°C	17.5	14.7	15.9	13.3	17.9	15.8
Shrinkage Factor for Liquid Volume		0.99994	0.9999	0.9999	0.99987	0.99995	0.99991
Liquid Volume Corrected	cu m	473.342	17.633	483.193	20.011	482.730	256.994
Density at 15°C	kg/l	0.5278	0.5278	0.5342	0.5342	0.5325	0.5325
Volume Correction Factor	Table 54E	0.99356	1.00077	0.99777	1.00419	0.99271	0.99800
Liquid Volume at 15°C	cu m	470.294	17.647	482.115	20.095	479.211	256.480
Liquid Mass	Mt	248.221	9.314	257.546	10.735	255.180	136.576
VAPOUR PHASE							
Vapour Vol. Corrected	cu m	129.127	584.769	121.095	584.217	131.477	357.164
Vapour Temperature	°C	9.2	5.6	13.4	10.1	14.9	11.4
Vapour Pressure	kg/cm2	6.575	5.603	6.595	5.598	6.524	5.417
Molecular Mass	g/mole	48.309	48.309	49.384	49.384	49.108	49.108
Vapour Density	kg/m^3	15.3537	13.5656	15.5047	13.6366	15.1963	13.129
Vapour Mass	Mt	1.983	7.933	1.878	7.967	1.998	4.689
Total Mass	Mt	250.204	17.247	259.424	18.702	257.178	141.265
Difference		232.957		240.722		115.913	
Total Weight in Air	Mt	249.666	17.210	258.866	18.662	256.625	140.961
Difference, Weight in Air	Mt	232.456		240.204		115.664	
GSV at 15°C	cu m	474.051	32.677	485.631	35.009	482.963	265.286
Difference, GSV at 15°C	cu m	441.374		450.622		217.677	

SUB TOTALS:	**Product :**	**LPG Mix**	**Tech. Butane**	**Sub Totals**
Total Metric tons (vacuo) :		929.975		929.975
Total Metric tons (air) :		927.975		927.975
GSV at 15°C, cu m :		1,752.240		1,752.240

Terminal Representative: Ivan Anikin

Surveyor's name Yuriy Voronin

Global Survey Solutions Ltd.

Report No. RU-0141-09-2016
Date of report 22-Sep-16
Vessel Ramagas
Location Tamanneftegas Terminal
Bill of Lading date 22-Sep-16

SHORE TANK REPORT

VCF calculated by API Standard 2540, MPMS Ch 11.2 dated 2007

		Tank No. **22**		Tank No. **23**		Tank No. **24**	
LIQUID PHASE		Before	After	Before	After	Before	After
Product		LPG Mix	LPG Mix	LPG Mix	LPG Mix	LPG Mix	LPG Mix
Date	dd-mm-yy	21-Sep-16	22-Sep-16	21-Sep-16	22-Sep-16	21-Sep-16	22-Sep-16
Time	0000	19:26	01:12	19:26	01:12	19:26	20:01
Total Tank Volume	cu m	602.399	602.399	609.796	609.796	609.776	609.776
Shrinkage Factor for Total Volume		0.99987	0.99973	0.99987	0.99973	0.99985	0.99983
Total Volume Corrected	cu m	602.321	602.236	609.717	609.631	609.685	609.672
Liquid level corrected	m	1.468	0.404	1.763	0.428	1.431	0.462
Liquid Volume	cu m	143.353	20.484	188.833	22.421	139.432	25.191
Liquid Temperature	°C	16.4	12.9	16.4	12.7	16.1	15.5
Shrinkage Factor for Liquid Volume		0.99993	0.99986	0.99993	0.99986	0.99992	0.99991
Liquid Volume Corrected	cu m	143.343	20.481	188.820	22.418	139.421	25.189
Density at 15°C	kg/l	0.5359	0.5359	0.5262	0.5262	0.5327	0.5327
Volume Correction Factor	Table 54E	0.99656	1.00512	0.99637	1.00591	0.99725	0.99875
Liquid Volume at 15°C	cu m	142.850	20.586	188.135	22.550	139.038	25.158
Liquid Mass	Mt	76.553	11.032	98.997	11.866	74.066	13.402
VAPOUR PHASE							
Vapour Vol. Corrected	cu m	458.978	581.755	420.897	587.213	470.264	584.483
Vapour Temperature	°C	15.3	12.2	15.4	12.7	15.3	14.7
Vapour Pressure	kg/cm2	6.915	5.382	6.089	5.396	6.002	5.9
Molecular Mass	g/mole	49.679	49.679	48.091	48.091	49.188	49.188
Vapour Density	kg/m^3	16.145	13.1732	13.9998	12.7582	14.1498	13.9738
Vapour Mass	Mt	7.410	7.664	5.892	7.492	6.654	8.167
Total Mass	Mt	83.963	18.696	104.889	19.358	80.720	21.569
Difference, Mass	Mt	65.267		85.531		59.151	
Total Weight in Air	Mt	83.782	18.656	104.663	19.316	80.546	21.523
Difference, Weight in Air	Mt	65.126		85.347		59.023	
GSV at 15°C	cu m	156.677	34.887	199.333	36.788	151.530	40.490
Difference, GSV at 15°C	cu m	121.790		162.545		111.040	

		Tank No. **27**		Tank No. **7**		Tank No. **6**	
LIQUID PHASE		Before	After	Before	After	Before	After
Product		LPG Mix	LPG Mix	Tech. Butane	Tech. Butane	Tech. Butane	Tech. Butane
Date	dd-mm-yy	21-Sep-16	22-Sep-16	19-Sep-16	19-Sep-16	19-Sep-16	19-Sep-16
Time	0000	19:26	01:12	15:31	17:01	17:01	18:25
Total Tank Volume	cu m	615.095	615.095	596.269	596.269	596.229	596.229
Shrinkage Factor for Total Volume		0.99991	0.99969	0.99995	0.9999	0.99994	0.99994
Total Volume Corrected	cu m	615.040	614.904	596.239	596.209	596.193	596.193
Liquid level corrected	m	2.782	0.406	2.032	0.415	3.625	1.059
Liquid Volume	cu m	349.491	21.453	237.014	22.871	481.616	93.070
Liquid Temperature	°C	17.5	11.6	18.7	17.3	18.3	18.4
Shrinkage Factor for Liquid Volume		0.99994	0.99984	0.99997	0.99995	0.99996	0.99997
Liquid Volume Corrected	cu m	349.470	21.450	237.007	22.870	481.597	93.067
Density at 15°C	kg/l	0.5298	0.5298	0.5778	0.5778	0.5766	0.5766
Volume Correction Factor	Table 54E	0.99363	1.00854	0.99263	0.99543	0.99339	0.99319
Liquid Volume at 15°C	cu m	347.244	21.633	235.260	22.765	478.414	92.433
Liquid Mass	Mt	183.970	11.461	135.933	13.154	275.854	53.297
VAPOUR PHASE							
Vapour Vol. Corrected	cu m	265.570	593.454	359.232	573.339	114.596	503.126
Vapour Temperature	°C	16.1	13.0	20.9	20.4	20.3	18.6
Vapour Pressure	kg/cm2	6.89	5.425	1.518	1.33	1.623	1.449
Molecular Mass	g/mole	48.742	48.742	58.051	58.051	57.979	57.979
Vapour Density	kg/m^3	15.748	12.9747	5.9413	5.5114	6.1908	5.8182
Vapour Mass	Mt	4.182	7.700	2.134	3.160	0.709	2.927
Total Mass	Mt	188.152	19.161	138.067	16.314	276.563	56.224
Difference		168.991		121.753		220.339	
Total Weight in Air	Mt	187.747	19.120	137.798	16.282	276.024	56.114
Difference, Weight in Air	Mt	168.627		121.516		219.910	
GSV at 15°C	cu m	355.138	36.166	238.953	28.235	479.644	97.510
Difference, GSV at 15°C	cu m	318.972		210.718		382.134	

SUB TOTALS:	**Product :**	**LPG Mix**	**Tech. Butane**	**Sub Totals**
Total Metric tons (vacuo) :		378.940	342.092	721.032
Total Metric tons (air) :		378.123	341.426	719.549
GSV at 15°C, cu m :		714.347	592.852	1,307.199

Terminal Representative: Ivan Anikin

Surveyor's name Yuriy Voronin

Global Survey Solutions Ltd.

SHORE LINES REPORT (Before)

Report No.	RU-0141-09-2016	Location	Tamanneftegas Terminal		
Date of report	22-Sep-16	Bill of Lading date	22-Sep-16	Calibration Temperature, ºC:	20.0
Vessel	Ramagas	**Before:** Date:		Time:	Walls made of: Russian steel

VCF calculated by API Standard 2540, MPMS Ch 11.2 dated 2007

Before

				LIQUID PHASE							VAPOUR PHASE										DIFFERENCE (Before - After)		
Shore Line Name	Grade	Total Line Volume, cu m	Shrinkage Factor for Total Volume	% Liquid of Total Volume	Liquid Volume Corrected cu m	Liquid TºC	Density @15°C kg/l	Volume Correction Factor	Liquid Volume at 15°C, cu m	Liquid Mass, Mt	Vapour Volume Corrected, cu m	Vap-our TºC	Molecular Mass, g/mole	Vapour Pressure, kg/cm2	Vapour Pressure, bar	Vapour Density, kg/m^3	Vapour Mass, Mt	Total Mass, Mt	Correction Factor to air	Total Weight in Air, Mt	GSV at 15°C, cu m	Difference Mass, Mt	Difference Weight in Air, Mt	Difference GSV at 15°C, cu m
110/2 C3/C4 Liquid	LPG Mix	192.500	1.00027	100.0%	192.552	27.2	0.5311	0.96835	186.458	99.028				6.310	6.188			99.028	0.99785	98.815	186.458	99.028	98.815	186.458
110/3 C3/C4 Liquid	LPG Mix	357.600	1.00027	100.0%	357.697	27.2	0.5311	0.96835	346.376	183.960				14.400	14.122			183.960	0.99785	183.564	346.375	183.960	183.564	346.375

SUBTOTALS Products:	LPG Mix	Tech. Butane	Sub Totals	LPG Mix	Tech. Butane	Sub Totals	LPG Mix	Tech. Butane	Sub Totals
Metric tons (vacuo):	282.988		282.988				282.988		282.988
Metric tons (air):	282.379		282.379				282.379		282.379
GSV at 15°C, cu m:	532.833		532.833				532.833		532.833

Terminal Representative: Ivan Anikin

Global Survey Solutions Ltd.

ANALYSIS REPORT
(Grade 1: LPG Mix)
After Loading

Report No.	RU-0141-09-2016
Date of report	22-Sep-16
Vessel	Ramagas
Location	Tamanneftegas Terminal
Product	LPG Mix
Bill of Lading date	22-Sep-16
Sample submitted as:	LPG Mix
Sample drawn:	by In-line autosampler
Sample description:	In-line autosample taken during loading
Received on:	
Testing performed by:	Third-party laboratory

On the: 22-Sep-16

Test	Units	Method	Specification	Result		
Composition liquid		ASTM D 2163 ASTM D 2421		Units mass %	Units volume %	Units molar %
Ethane				2.59%	3.85%	4.19%
Propane				54.71%	57.08%	60.38%
n-Butane				26.01%	23.56%	21.78%
Methyl propane (isobutane)				14.74%	13.86%	12.34%
n-Pentane				0.51%	0.43%	0.34%
2-Methyl butane (isopentane)				1.35%	1.14%	0.91%
Dimethyl propane (neopentane)				0.09%	0.08%	0.06%
Molecular Weight		Calculated			48.662	
Relative Density 60/60°F (in vacuo)		Calculated			0.5292	
Density @ 15ºC (in vacuo)	kg/l	Calculated			0.5294	
Copper strip corrosion (1 hour at 37.8		ASTM D 1838			No. 1	
Hydrogen Sulphide	ppm	ISO8819			Negative	
Sulphur content	mg/kg	ASTM D 6667	max. 140		31	
Gauge Vapour pressure at 40ºC	kPa	EN ISO 8973			1100	
Gauge Vapour pressure <150 kPa at	ºC	EN 589 Annex C			-10	
Free water content	ppm	GOST R52087-03			None	
Dissolved Residue	mg/kg	ASTM D 2158			25	

Chemist: Anna Seryogina

Global Survey Solutions Ltd.

ANALYSIS REPORT
(Grade 2: Tech. Butane)
After Loading

Report No.	RU-0141-09-2016
Date of report	22-Sep-16
Vessel	Ramagas
Location	Tamanneftegas Terminal
Product	Tech. Butane
Bill of Lading date	22-Sep-16
Sample submitted as:	Tech. Butane
Sample drawn:	by In-line autosampler
Sample description:	In-line autosample taken during loading
Received on:	
Testing performed by:	Third-party laboratory

On the: 22-Sep-16

Test	Units	Method	Specification	Result		
Composition liquid		ASTM D 2163 ASTM D 2421		Units mass %	Units volume %	Units molar %
Ethane				0.01%	0.02%	0.02%
Propane				0.64%	0.73%	0.84%
Propene (propylene)				0.01%	0.01%	0.01%
n-Butane				67.94%	67.08%	67.81%
Methyl propane (isobutane)				31.29%	32.06%	31.23%
2-Methyl butane (isopentane)				0.03%	0.03%	0.02%
Dimethyl propane (neopentane)				0.08%	0.08%	0.06%
Molecular Weight		Calculated			58.009	
Relative Density 60/60°F (in vacuo)		Calculated			0.5768	
Density @ 15ºC (in vacuo)	kg/l	Calculated			0.5768	
Copper strip corrosion (1 hour at 37.8		ASTM D 1838			No. 1	
Hydrogen Sulphide	ppm	ISO8819			Negative	
Sulphur content	mg/kg	ASTM D 6667	max. 140		14	
Gauge Vapour pressure at 40ºC	kPa	EN ISO 8973			333	
Gauge Vapour pressure <150 kPa at	ºC	EN 589 Annex C			40	
Free water content	ppm	GOST R52087-03			None	
Dissolved Residue	mg/kg	ASTM D 2158			43	

Chemist: Anna Seryogina